ACCIDENTAL WAR

Some Dangers in the 1960's

The Mershon Report

With an Introduction by

BERTRAND RUSSELL

One Shilling *Twenty Cents*

PUBLISHERS' NOTE

Human optimism dies hard: to give but one example, on 1st January 1939 Lloyd's were giving 32—1 odds against war in 1939. It is dangerously easy in such a spirit of optimism to convince oneself that nuclear war is so terrible that it could not happen. With the development of new and speedier weapons systems and of more and more nuclear weapons the danger of war is closer than ever.

During the last few years an increasing number of experts in America have become concerned about the extreme dangers of the Arms Race, and the likelihood of a nuclear war breaking out more or less by accident. Much of the basic material on this subject has not been readily available to the general reader, especially in this country, and we hope that the publication of the Mershon Report will do something to correct this situation.

We are indebted to the Mershon Center for Education in National Security for permission to republish this research paper, which we have done with a minimum of alteration. The italics are ours (the original report was duplicated, hence contained no italics) and some passages that seemed to us repetitive have been omitted. Otherwise the report is absolutely unaltered.

The reader will observe that the report is exceedingly sober and cautious. Indeed, we have felt obliged to print our criticisms of the authors' proposals (as distinct from their analysis). But the fact that the report has been produced by a group of people who are by no means unilateralists only adds weight to the enormous seriousness of its conclusions. The Mershon Report is an example of the way in which scientists, strategists and military analysts the world over are beginning to look in horror on the development of the Arms Race: and it is of special importance in that it is almost the only systematic study of the danger of accidental war in existence.

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Accidental War:

SOME DANGERS IN THE 1960's

The Mershon Report

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instructors are to give is determined by a supreme instructor, Dr. Hurt, the Oak Ridge National Laboratory psychologist. Some of the remarks which those whom he instructs are to spread throughout the country are worth quoting:

> *"The good-goodies and the fancy pants — the brains minus the brawn — are most apt to fall by the wayside when war comes. Not if war comes — just when. There will be war - - - it is just a question of when, and the main thing we have to fear is people out of control — even more than the atom out of control - - - I recommend that everyone with a fall-out shelter include a gun in the equipment - - - I recommend shooting anyone who tries to invade a fall-out shelter."*
>
> *(The Oak Ridger, November 8, 1961)*

I am afraid that Dr. Hurt is considered sane. With such men engaged in manufacturing fanatics, it is almost inevitable that in a time of tension some excitable people in responsible posts will feel that individual initiative is called for to force the Government to take action.

Anyone who requires new material for nightmares should bear in mind the following statements which have been made by men in positions of critical responsibility, and which reflect the views of their colleagues around the world:

Admiral Radford:

> *"I demand - - - total victory over the Communist system - not stalemate."*

In other words, war.

General Nathan Twining:

> *"If it were not for the politicians I would settle the war in one afternoon by bombing Soviet Russia."*

General Orvil Anderson, Commander of the Air War College:

> *"I would be happy to bomb Russia, just give me the order to do it."*

These statements are the ravings of men in power. See New York "Nation", October 28, 1961, "Juggernaut: The Warfare State".

The sombre conclusion is that, unless the policies of the Great Powers are radically changed within the next few years, the chances of human survival are very slight.

The Mershon Report

THE MERSHON REPORT

Our aim in this paper is to consider the possibility that a major accidental war may occur at some time in the next ten years. "Accidental war" as we use it here is equivalent to "war by miscalculation" and "unintentional war". A formal definition is not required; the question of transcendent practical interest is the likelihood that a large-scale nuclear war between East and West may, through some combination of circumstances, come about without the intention of either side to launch such a war. We limit our consideration to the next ten years because this now seems to be the critical time period and because predictions further into the future become too speculative.

Many wars in history have been more or less "accidental". But the destructive power of modern weapons and the extraordinary compression of military time that goes with them bring to the question of accidental war a new and potentially terrifying significance.

There seems to be a widespread but seldom clearly articulated belief that any large-scale nuclear war in the next decade will be really accidental. The reasoning is that each side would prefer to develop economically without launching a war at great risk and for uncertain gains, and that some form of coexistence is mutually desired. But in the absence of effective arms controls, world leaders seem to regard nuclear weapons as the arbiter of an uneasy peace.

The likelihood of an accidental war depends on the level of international tension and on the strategic posture of each side. In recent months there has been increasingly sophisticated discussion of the requirements of "stable" deterrence. Relatively invulnerable forces are militarily desirable. A retaliatory deterrent must be "credible", i.e. the enemy must know it not only could but *would* be used against him if he attacked. The notion of a "pre-emptive strike", to prevent destruction of one's own vulnerable forces, has received some attention in military writing and Congressional testimony. But, almost without exception, the analyses of deterrence take for granted good military intelligence and rational (if cold-blooded) decision-making on each side. The only kind of "accident" ordinarily mentioned — and then not very conspicuously — is a pre-emptive strike resulting from faulty intelligence warnings. There is no allowance for international tensions, collective anxieties and frustrations, and the predispositions of individual leaders. Accidents — the unforeseen and unpredictable, the irrational — do not lend themselves to precise analyses, but we believe that they must be taken much more seriously and explicitly into account in our planning for military security.

ACCIDENTAL WAR

ACCIDENTAL WAR IN HISTORY

Most wars in history were in some degree accidental; just how accidental they were is a question upon which historians disagree. It is particularly difficult to distinguish "accidents", as we are concerned with them here, from the manifold mistakes of military and political judgment which seem so clear in the hindsight of history. Nevertheless, there are some insights from the past which are useful in our study of the 1960's.

Tension which existed before the start of hostilities played an essential part in igniting most wars. This tension provided the momentum for war once an accident or incident occurred, as in World War I and the Franco-Prussian War. The importance of tension is revealed in situations where the avowed *casus belli* was removed before hostilities began, yet pressures for war made it inevitable. This was the case when Serbia gave a seemingly satisfactory and conciliatory reply to Austria's ultimatum, but World War I still broke out. Similarly, in 1898 Spain finally acceded to American demands regarding Cuba, yet the pressure for war in this country, raised to fever pitch by the sinking of the Maine, was irresistible.

There are also cases in which provocation for war existed and yet war was avoided because tension was relatively low or the national temper less belligerent. Thus the Japanese bombed the gunboat Panay and strafed its survivors in 1937. The sinking of the Lusitania failed to bring the U.S. into World War I. And there are numerous examples of treaty violation and overt aggression — Hitler's occupation of the Rhineland and Mussolini's invasion of Ethiopia, for instance — which failed to bring war because nations were conspicuously unready for war and determined to pursue peace.

Many wars in the past have resulted from military and diplomatic miscalculations. But it is difficult to find parallels for the kinds of military systems accidents which we discuss below. The disastrous charge of the famed British light brigade in the Crimean War resulted from a misinterpreted order. The sinking of the Maine in Havana harbor may have been a genuine accident.

Human aberrations, too, have played their part in history. Hitler is a notable example from recent history. Napoleon's apparent belief in the invincibility of his armies certainly contributed to their ultimate defeat. And in a few cases misguided patriotism on the part of enthusiastic junior officers has led to military disasters.

It is clear that nuclear weapons and their delivery systems bring a new and frightening cause of accidental war into the realm of possi-

bility. For this particular danger history gives us little guidance. The principal lessons of history seem to be (1) that human aberrations do occur in critical positions, and (2) that accidents lead to wars when international tensions are high enough or when either side needs only an excuse for war.

PREVAILING OPINION ON ACCIDENTAL WAR

In an effort to survey the opinions of presumably knowledgeable persons on the dangers of accidental war in the 1960's, we sent letters of inquiry to members of the Senate Foreign Relations and Armed Services Committee, the House Foreign Affairs and Armed Services Committees, the "Gaither Panel", the "military Rockefeller Panel", and a small number of other selected persons. We asked for general comments on accidental war and on the relative seriousness and likelihood of the five types of accident we discuss in the next section.

The replies we received showed great diversity in approach to the problem of accidental war, as well as in their ranking of the seriousness of the five categories. Some indicated great concern with the probability of accidental war occurring if higher and higher levels of armament are pursued by both the communist and the Western nations. Others expressed a belief that no general nuclear war is possible so long as the United States maintains a strong deterrent force. Several felt that the danger of each of the five types of accident is of equal importance, either because all five are very great dangers or because all are possibilities.

Of those who did rank the accidents in order of seriousness, the majority ranked the spread of limited war as the most serious danger. Several replies considered this cause as by far the most important, with the others either related to it or so improbable as not to merit ranking. Diplomatic miscalculation ran a close second. Several ranked this first, one or two by a wide margin. Others felt that this category and limited war are intimately related in that any limited war would probably be caused by a miscalculation. One senior military analyst rated the joint probability of war from these two at 50 per cent in the next ten years. This emphasis on the danger of the spread of limited war contrasts with several other replies which indicated a feeling that no general war was possible and that small wars only would take place in the next ten years, but did not consider the possibility of their spreading unintentionally. Catalytic war was ranked by the majority as the least likely to occur, and several felt that it does not merit serious consideration. Some respondents felt that it is unlikely except as a consequence of limited war. Systems accidents and human aberrations were considered, on the whole, as less serious than the spread of limited war or diplomatic miscalculation.

An educator expressed the view that, while the spread of limited war is the greatest risk, it is also the area in which "resourceful, determined statesmanship could be most effective in preventing the risk from arising". One person did not attempt to rank the five categories but guessed that it would be almost impossible to contain limited wars. A Congressman felt that, although the spread of limited wars is now the most dangerous potential cause, if there is a further dispersal of nuclear weapons the danger will be shifted to the multiplied number of possible defense systems accidents. It was implicit in some replies, particularly many from Congressmen, that the danger of accident was conceived of as lying with Soviet error, miscalculation, or aberration, and that such danger was not present on this side of the fence. Others seemed to regard the danger as existing in both power blocs.

SPECIFIC DANGERS IN THE 1960's

DEFENSE SYSTEMS ACCIDENTS

Accidents of this type are almost entirely a consequence of modern weapons and their associated technology. Our concern is with the possibility that at some time in the 1960's a large nuclear attack might be launched as a result of a technical mishap or a simple human mistake. The asymmetry of information compels us to focus our attention on U.S. and Western forces and apply a kind of correction factor to allow for the communist nations.

Accidents may occur at any point in the processes of (1) information gathering, (2) information evaluation and decision-making, and (3) the launching or near-launching of weapons carriers. Warning of an attack in progress will come from radar systems and, as developments progress in the 1960's, from the Ballistic Missile Early Warning System (BMEWS) and the Midas early warning satellite. Warning of an impending attack will come largely through intelligence activities. In principle, and as far as possible in practice, the ultimate responsibility for information evaluation and decision-making rests with the President. A great deal of auxiliary machinery exists to advise him and in some cases to save time in implementing decisions he may reach. Some time-saving, more or less precautionary, steps, such as the launching of bombers under "positive control", may be taken on the authority of lesser commanders. Retaliatory forces in the 1960's will almost certainly consist of manned bombers with a rapidly growing proportion of first and then second and third generation missiles.

It is of interest to consider some of the incidents which have occurred in the U.S. strategic machinery to date and some kinds of possible accidents which might be hypothesized. Unclassified information is of course limited, but we have tried to survey published

materials, and Congressional hearings are notably useful sources. Precautionary measures have been taken in SAC as a result of ambiguous warnings on many occasions. Nuclear weapons have been involved in about ten major accidents (see below) but there have been no nuclear explosions. One operational ICBM blew up on its launching pad. Anti-aircraft missiles have misfied several times and have been accidentally launched at least twice. False radar warnings, including an apparent flight of bombers moving over the Atlantic at 2,000 m.p.h., have occurred frequently. There have been many test alerts of U.S. retaliatory machinery. On the communist side of the fence very little is known, but Premier Khrushchev is reliably reported to have told Vice-President Nixon about an erratic Soviet missile which was destroyed by a signal from the ground as it headed toward Alaska.

Many kinds of possible systems accidents have been suggested, sometimes, we believe, without much technical basis in fact. Neither a flock of geese nor a shower of meteors is likely now to trigger U.S. retaliation with manned bombers.

Similar dangers are certainly increased, however, as we move more firmly into the missile age and warning times become shorter, particularly if our retaliatory forces are vulnerable. The technical development of our over-all machinery of retaliation in the next decade presents some major problems with respect to safety and the avoidance of potentially dangerous accidents. More sensitive radars are more likely to give spurious signals. Faster reaction times will require less human decision-making and a greater dependence on automation. Computers may be required to discriminate reliably between missiles and meteors in a few minutes at most. Increasingly reliable unjammable and rapid means of communication must be built. **It is clear that the President has already been obliged to delegate, in fact if not in principle, some of his ultimate authority to order the use of nuclear weapons,** first for defensive purposes, and second for retaliation. **He will be forced to delegate more.**

The present "positive control" of airborne SAC bombers has no parallel in ballistic missiles. Operational missile warheads are not armed until ready for firing, but **the missiles do not have effective "destruct" systems which would allow them to be destroyed in flight.**

Communist and Western defense systems may be expected to follow the same very general course of development, although technical emphasis and operational systems will differ. There is strong evidence, from air safety records, for instance, to suggest that communist systems will be somewhat less sophisticated insofar as technical safeguards against accidents are concerned. There is also a question about how much responsibility is delegated to communist

commanders. Thus Premier Khrushchev recently implied that Marshal Malinovsky or others could order an attack on U-2 bases.

ACCIDENTAL NUCLEAR EXPLOSIONS

In examining the question of accidental nuclear explosions we are particularly handicapped by the lack of unclassified information. But some insight may be gained by (1) collecting data on nuclear accidents (although no weapons accidents have resulted in a yield of nuclear energy) and by (2) attempting some order-of-magnitude calculations on the probability of an accidental nuclear explosion. A nuclear explosion involves bringing together, under exactly the right physical conditions and in a time period measured in millionths of a second, a minimum quantity of fissionable material such as uranium 235 or plutonium.

Data are available on accidents in the nuclear energy industry. Two or three major reactor accidents have occurred which involved a temporarily uncontrolled but non-explosive release of nuclear energy. About half a dozen persons, here and abroad, have received lethal radiation doses and a larger number have received sub-lethal doses. Two or three deaths have occurred in the process of weapons-oriented experimentation. But except for the common basic physics involved, nuclear industrial accidents bear little relation to the problem of the accidental explosion of a nuclear weapon.

Approximately a dozen major incidents or accidents involving U.S. nuclear weapons are known or reliably believed to have occurred, mostly in plane crashes. Two of these "Broken-Arrows", to use the unclassified Air Force code word for an accident involving a nuclear weapon, were overseas, one in England and the other in North Africa. On two occasions, one confirmed by the Air Force, nuclear weapons or parts of them are believed to have been jettisoned in emergencies over water by planes in flight. On one occasion, in North Carolina, a nuclear weapon was accidentally dropped by a B-47 in flight with a chemical explosion on impact. Four other "Broken-Arrows" have occurred in plane crashes in Texas, Louisiana, New Mexico, and Kentucky. A nuclear-armed B-47 exploded on the ground at a Louisiana base. Most recently, a Bomarc anti-aircraft missile with a nuclear warhead burned at a New Jersey base. In many of these incidents a localized radiation hazard has existed briefly and measures have been taken to seal off and decontaminate the area affected. Many lesser accidents involved in the maintenance, transportation, modernization, etc. of actual nuclear weapons are known to have occurred. One informed estimate places the number of these at about fifty for U.S. weapons since World War II.

The fact that, in a sizable number of accidents, no nuclear explosions have resulted indicates that, to date, U.S. nuclear weapons have effective built-in safety features. Some of these features have been proved in Nevada weapons tests. A consideration of the physical conditions which must exist for a nuclear explosion to occur suggests a variety of electrical and mechanical safeguards, and many of these are presumably incorporated into U.S. nuclear weapons. SAC crews are thoroughly trained in handling their weapons and in the sequence of steps in the arming process. For weapons carried in bombers and manually armed in flight, a maximum number of safeguards is possible. But for weapons inaccessible in flight, in missiles such as Atlas or Minuteman or externally carried by aircraft (such as Hound Dog), arming must be accomplished automatically or electrically, and more difficult safety problems are clearly presented.

Some semi-official estimates place the probability of explosion of a single weapon under stress, as in a crash or maintenance mishap, in the one in 1,000,000 to one in 1,000,000,000 range. Our own order of magniture judgment suggests that one in 100,000 would be a more realistic average value for different kinds of weapons. Making some reasonable assumptions about the number of weapons (10,000 for the U.S.), the miles traveled by the average weapon in ten years, the crash rate of weapon carriers, the frequency of significant maintenance operations, etc., we are led to the conclusion that the chances are of the order of one in 100 that a U.S. nuclear weapon will explode at some time in the next ten years. This extremely approximate estimate is for essentially mechanical malfunctions only; we make no attempt to quantify the various possibilities of human error. Nor do we have any basis for quantitative speculation on the likelihood of explosion of the nuclear weapons of other countries. Probably the communist nations, including China, are and will be less safety-conscious than the U.S., and the spread of nuclear weapons to more countries in the next decade certainly compounds the problem.

There will probably be, in all the nuclear countries, great pressure for the development of lighter, smaller and more novel weapon designs. Provision must be made for arming weapons by remote control. Various technical compromises between military reliability and safety will have to be made. For these reasons, experience with manned bomber-carried weapons to date is not an infallible guide to the future. Considering all these factors, we are led to the very general conclusion that **the accidental explosion of one or more nuclear weapons in the next ten years is not improbable.**

Would an accidental nuclear explosion start a war? Possibly, but probably not, unless it occurred in a time of extreme tension.

Or unless it happened to destroy an important city or military target or there were reasons to believe that it was really an enemy weapon. An accidental explosion probably would not result in the full design energy yield of the weapon and it might therefore be relatively less destructive. Several accidental explosions in a short time period could have serious consequences, but the probability of these happening coincidentally is infinitesimal. In sum, it appears that accidental nuclear explosions are among the least likely direct causes of accidental war.

HUMAN ABERRATIONS

The carefully planned and elaborate safety devices built into U.S. weapons systems are designed to minimize the probability of serious accidents resulting from human error or inadvertence. What about the possibility that a person, in some position of responsibility in a man–machine system and suffering from some form of mental aberration, could intentionally bring about a significant act of war? Our concern here includes not only persons with formal responsibility, such as missile or aircraft commanders, but also persons of any rank or status who might be capable of causing serious mischief.

History furnishes numerous examples of failures and incompetence among military commanders — there are a few clear cases of military misadventures undertaken without authorization. But because mental illness has only very recently been recognized as a distinct medical problem, the historical data are of limited value. And modern weapons have enormously multiplied the capacity for mischief that may rest, at least temporarily, with an individual.

Although the dividing line is not sharp, human breakdowns can usefully be analyzed into those occurring at (1) the command level and (2) the operational level of our defense systems. In World War II a number of U.S. general officers were relieved of their responsibilities for this cause although the exact numbers are hard to establish. At the highest command level stands the tragic example of Adolf Hitler, who manifested increasingly obvious signs of mental illness as the war progressed. At low levels, "promotion neurosis" was a recognized psychiatric phenomenon in which, for instance, a competent sergeant suddenly commissioned a lieutenant would develop partially incapacitating anxieties. Whether an aberrant commander can compel his subordinates to carry out a suspect order seems to depend on various circumstances, but a **great deal of evidence suggests that in many cases he can.**

Modern weapons have brought a great downward diffusion of effective, if not theoretical, responsibility for great destructive power to thousands of persons. Some World War II data on the

general incidence of mental breakdown in the military services are pertinent, if not conclusive, for the circumstances of particular concern in the 1960's. In the U.S. forces 43 per cent of all medical discharges were for neuropsychiatric causes. A large proportion of these discharges — 40 per cent in a similar Royal Air Force study — occurred before operational or combat experience. In the RAF there was no evidence of predisposition to mental breakdown in 32 per cent of all cases.

Of twelve psychiatrists with military experience whose opinions we sought, ten believed that the problem of human aberrations in relation to modern weapons systems was serious enough to warrant extensive consideration. There was general agreement that no existing tests will reliably screen out individuals susceptible to mental breakdowns. The range of potentially serious psychological problems is extremely wide. The possibly harmful effects of great responsibility, maintained over long time periods in an essentially passive peacetime (or Cold Wartime) role, are nearly impossible to predict. The limited official information we were able to obtain indicates that the main qualifications of, say, SAC bomber and missile crews are high performance ratings and, although these ratings certainly involve a number of psychological factors, essentially no specific psychological screening is now used.

On a statistical basis and over a period of years, the probability of a few breakdowns in positions of great responsibility is high. Some efforts have been made to build safeguards against human aberration into weapons systems. Thus Air Force regulations require that the signal to an airborne bomber to proceed to its target must be verified by the officer members of the crew. A further measure of control is exercised over the refuelling plane if one is required and, in extreme cases, an errant bomber can be destroyed by other planes in its flight if this is possible. It is also known, for instance, that present plans for the Polaris weapons system provide for verification of the command to launch missiles by several members of the crew. Undoubtedly other safeguards in U.S. weapons systems exist but have not been made public. There inevitably remain, however, situations in which individuals, such as the pilot of a nuclear armed fighter-bomber, are largely **free of safeguards.** There are a few people in very special positions—Francis Powers is an example—who are subject to a minimum of restraints. It should be noted that the possibilities for trouble-making by an aberrant individual are by no means limited to the delivery of nuclear weapons. Thus a U-2 ground crewman, for instance, would have been in a position to sabotage Powers' flight.

Essentially no data are available on human breakdowns and safeguards to minimize their consequences in the communist armed forces. There are probably fewer specific allowances made for

mental illnesses than in the Western nations. The distribution and regulation of critical responsibilities among individuals may be similar in practice although quite different in principle. Reports from defectors to the West indicate that communist pilots, for instance, are under relatively strict orders to shoot down their errant comrades.

The dangers of accidental war resulting from some form of human aberration in the next ten years are nearly impossible to quantify. But the range of possibilities is very large and, at least in comparison with technical accidents, safeguards are harder to devise.

UNINTENDED SPREAD OF LIMITED WARS

The unintended spread of less-than-general, limited war into a general war including a massive nuclear exchange is viewed by many observers as the most likely origin of an accidental war in the next decade. The reason for this belief doubtless arises from the near certainty of the occurrence of military conflicts between the two opposing world power blocs, and thus, to a greater or lesser extent, between the major nuclear powers.

One of the prominent uncertainties in an analysis of possible future wars is the role of nuclear weapons. These weapons are probably historically unique in that, while they are completely untried (except as destroyers of cities) in warfare, the professional military planners, apparently somewhat more on the American side than on the Russian, are becoming more and more dependent on them in future strategies for limited as well as general war.

This is particularly important in Europe where NATO is essentially committed to meeting any kind of attack with U.S. nuclear weapons. This fact, together with the Russians' apparent lack of acceptance of the idea of a nuclear limited war and the destruction such a war would cause throughout Europe, makes very unlikely a limited war in Europe without a simultaneous U.S.–U.S.S.R. nuclear exchange. Indeed, **any kind of armed conflict on a major scale in Europe which is not rapidly brought under control would probably trigger a general nuclear war.**

In Asia and the Middle East, however, limited wars are more likely to stay limited as they have in the recent past. In these areas wars are more likely to be fought by "proxies" rather than by the great powers themselves. We will probably continue to see struggles between satellites and client states of the two power blocs, revolutions involving strong support of the rebels by a neighbouring state, and violent internal rebellions. In most of these cases the major nuclear powers will only be involved to the extent of

providing the material means to maintain the conflict and, possibly, specialized manpower such as pilots and submariners. Occasionally a major power may be involved directly on one side or the other as the U.S. was in Korea, but the conflict would probably remain limited if the other major power stayed out. In general, the use of proxies will assist in keeping a conflict limited, since they will not usually possess the means, particularly nuclear weapons, of spreading the conflict. But this argument may be less valid in the later sixties.

We can pick out several factors which will help to determine whether a limited conflict will spread. It is essential that communications be kept open between the combatants, or at least between their great power supporters, so that no action by one side will be interpreted by the other as requiring an expansion of the conflict. The costs of the struggle must not be allowed to get so high for either side — in terms of geography, military losses, physical destruction, political and economic factors, etc. — that it would be impossible to negotiate some kind of settlement rather than face an expansion of the war. This will require some changes in the traditional goals or end points of wars — "unconditional surrender", "punishment of the aggressor", etc. — as well as some modification of the traditional military doctrine of attempting primarily to destroy the enemy military forces. It will also be helpful to end or at least stabilize, in terms of geography and force, the military portions of the struggle as soon as possible (preferably before they begin).

It is well to note carefully the difficulties the use of nuclear weapons adds to keeping a conflict limited. The distinction between the use and non-use of such arms is qualitatively clearer and surer than that between various weapon yields and/or targets—the main criterion of "limitation" sometimes postulated by proponents of a nuclear limited war strategy. In addition, their great destructiveness and the lack of knowledge of their over-all effects in war adds to the uncertainties attached to any use of nuclear weapons. Finally, the use of nuclear weapons by one side in a limited war would doubtless require the other side to do likewise. This would, in turn, probably bring the two major nuclear powers more actively into the struggle, with the consequent increased likelihood of the war spreading.

If one of the major nuclear powers does become involved in a limited war, it may or may not have the means for fighting the war with conventional forces. A "starving" of conventional capabilities may thus tend to force the use of nuclear weapons, with all their hazards, in a limited war.

Our discussion has tacitly assumed the current distribution of nuclear weapons among nations. As these weapons become more widely diffused the problems of limitation of war become correspondingly great, since more nations will have the means of spreading the conflict and/or bringing in the major powers. This problem is especially disturbing with respect to Communist China, since the Chinese rulers are on record as believing that a general nuclear war would be less disastrous for China than for its enemies.

CATALYTIC WAR

The danger of catalytic war results very largely from the spread of nuclear weapons to a larger number of countries. It is possible that a small nuclear power could, in the right circumstances, launch a successful, unidentified, sneak attack on one or more of the major powers and thus precipitate a massive nuclear exchange between them. Viewed in the context of the historical behavior of nations, the likelihood that a nation would be strongly motivated to undertake such an attack seems small. Concealment of the source of the attack would be, at least in many cases, difficult.

A kind of general war catalyst which could become significant as more countries acquire nuclear weapons is that in which one of the small power participants in a limited war deliberately undertakes to cause a spreading of the conflict, by either an initial use of nuclear weapons or by their use in a deliberately provocative way. Red China seems to represent a particular danger.

DIPLOMATIC AND MILITARY MISCALCULATIONS

East–West tensions have fluctuated in the years since World War II, but there has been a trend for periods of tension to occur more frequently during the last five to ten years. In a time of tension in the next decade, nuclear war could result from intelligence blunders or miscalculated high-level decisions. It may not be practical to try to predict situations or mishaps which might occur, but it is at least instructive to review some crises of the past and to see to what extent the dangers which existed might have led, through some form of miscalculation, to disaster.

In 1953, the Korean War may have come near to being expanded when the United States threatened to bomb airfields across the Yalu River and use tactical nuclear weapons if the war continued. While truce negotiations were going on, South Korean troops broke into prisoner of war compounds and released North Korean prisoners. The Chinese did not choose to resume hostilities over this incident, probably partly because they knew they could not win an expanded war.

In April of 1954, when the U.S. made known its offer of aerial support for the embattled French troops in Indochina, Britain was not in favor of the proposal and the planes were not sent. Such an offer of assistance to an ally fighting a colonial war is more unlikely today, but, should it take place, it might be even more at the risk of direct Russian or Chinese intervention, possibly with "volunteers" and nuclear weapons. The Suez crisis in November of 1956 was a particularly dangerous situation. The Israeli-Egyptian fighting on the Sinai Peninsula; the British-French invasion of the Suez area with the Russian ultimatum to withdraw or face strategic rocket attacks; and the Hungarian Revolution combined to increase world tension to a dangerous level. When intelligence reports of Soviet troop movements and unusual air activity over Turkey were received in Washington, the President was called back from Gettysberg and a special meeting of top security advisers was called. Fortunately, it was soon learned that the Soviet movements were not direct threats in the Middle Eastern situation, and U.S. forces were only partially alerted. But if the unusual activity had not been identified and U.S. forces had been fully alerted, a Russian alert would probably have followed, further increasing the danger of the situation.

Again in the Middle East in 1958, when American marines landed in Lebanon, British paratroopers landed in Jordan, U.S. Army troops with nuclear weapons were sent to Turkish air bases, and other U.S. armed forces, including SAC, were alerted, the U.S.S.R. made another, though milder, threat to the Western nations. Soviet forces began maneuvers at key points along the Soviet borders adjoining Turkey and Iran. U.S. and British diplomats and military leaders felt that Russian reprisal was unlikely, but, with several countries' forces poised within fighting distance and alerted for an emergency, any accident or miscalculation could have triggered war with Russia.

Taiwan and West Berlin have been scenes of crisis in the past and are likely to be in the future. If the United States came to the Nationalists' aid again in defense of the Offshore Islands, chances of war would probably be greater than they were in 1954 and 1958, as China grows stronger and especially when she develops her own nuclear weapons. Defense of the islands, and even of Formosa, will become militarily difficult against even short-range missiles with nuclear warheads. Similarly in Germany, if control of the access routes to West Berlin are turned over to East Germany as Russia threatens, some form of limited war could well result, and with the West committed to the use of nuclear weapons the situation would be dangerous. Attack on a Western airlift into Berlin might also mean expanded war. Because leaders on both sides of the Iron Curtain seem to recognize the danger of any war in Europe and because Russia does and will continue to have control over East

Germany, the danger here will probably be less than that in the Taiwan Straits when China develops her own weapons.

The recent U-2 incident shows how a state of tension can arise suddenly during a period of relative calm. Soviet threats of retaliation against U.S. bases if further flights are attempted and U.S. slowness in announcing that the flights had been stopped set up an atmosphere of threat and counter-threat.

In each of these postwar crisis situations either the U.S. or the U.S.S.R. threatened some kind of forceful action and each took some kind of measures to carry out, or react against, the threat. In each crisis forces were more or less poised for action, and a miscalculation or accident could have touched off a war.

INTERNATIONAL TENSION AND READINESS FOR WAR

In the preceding section we have briefly discussed several types of accidents which could lead to war in the next ten years. Whether any of these accidents, by themselves or in combination, would lead to war depends very much on the state of tension or "readiness" for war which exists when the accident happens. This is one of the principal conclusions from our historical survey of the causes of war. And it is a conclusion which, because of the nature of modern weapons and strategic balances, seems likely to apply during most of the 1960's.

There is at least one important difference between the historical situations and the 1960's: it is less likely that a modern nation can be propelled directly into a nuclear war by the temper of its people. American bellicosity toward Spain in 1898 would not have led to war if both sides had had nuclear weapons. Public opinion may stimulate a government to action, but it may also effectively preclude certain actions if the likely consequences of those actions are too serious. (Red China is a possible, troublesome exception to this generalization because public opinion is probably fairly manipulable and its restraining influence may be minimal.) Internal pressures, of the sort that Premier Khrushchev hinted may have resulted from the U-2 incident in Russia, may lead to tougher policies, but it is very doubtful that either popular or official outrage would lead to a real demand for nuclear war. It is possible, however, that public demands for "firmness" or "action" might greatly increase the danger of war in times of tension.

In the 1960's the level of tension at any critical time can have a decisive role in the unique kind of guessing game which military leaders, particularly those with vulnerable retaliatory forces, may consider themselves obliged to play. The combination of vulnerable forces, such as bombers at their bases and "soft" liquid-fuelled

missiles, and the very short radar warning times associated with a ballistic missile attack could place upon national leaders in times of extreme tension a burden of decision unprecedented in history. So long as intelligence is less than perfect — and it always is — the temptation to launch a pre-emptive attack to insure one's survival must always be present. Relatively little has been written or said publicly about this problem. But it may be significant that, quite recently and for almost the first time in our history, the traditional "strike-second" policy of the U.S. has been openly questioned. In principle the danger of an accidental war resulting from a misguided pre-emptive attack is always present, but as a practical matter the danger is probably greatest in periods of peak tension.

In the middle and late sixties, both the U.S. and the U.S.S.R. should have less vulnerable retaliatory forces. Populations may, in effect, be held as hostages subject to destruction, but the temptation to attack pre-emptively should be somewhat reduced and a greater measure of stability should exist in the bilateral strategic balance. Although one danger of accidental war is perhaps lessened, another danger — harder to predict — may be growing. This is the diffusion of nuclear power. The U.S. and the U.S.S.R. will not be the only nations involved in the global stategic equilibrium. Red China seems, again, a cause for special concern. We shall not attempt to speculate in detail upon the situations and dangers which may develop. But it is conceivable that in the 1965-70 period the central problem of national security may become not so much how to deter the enemy with the threat of force, which has been the main concern so far, but how, in an atmosphere of tension, to guard against a variety of possible accidents that could lead to mutual destruction.

If the chances of war by accident rise sharply in periods of tension, it is worth while to ask how frequently these periods of tension occur. Our listing of some of the postwar "crises" in the preceding section shows that, on the average, peaks of tension occurred a little less often than once a year. Statistics may be of limited value, but the postwar experience gives at least some indication of what we may expect in the next ten years without some major changes in the Cold War. It can be argued that the communist nations are fairly well "contained" at the present and have fewer opportunities for crisis-generating mischief. But the Berlin question is conspicuously unsettled, the timing of the U-2 incident could hardly have been predicted, and the rise of Red China presents a troublesome prospect. It seems prudent to assume that there will be, in the 1960's as in the last fifteen years, occasional peaks of tension. At these times accidents, of whatever nature, are most likely to lead to war.

The greatest danger, in a time of tension, is that normally insignificant events or accidents may set in motion on both sides a series of events leading to disaster. We might have a kind of self-generating accidental war. Predictions tend to be conjectures. But in a time of moderate tension, let us say, a small war occurs — there have been many of these in the postwar years. A major power which considers its interest threatened decides to intervene on a limited scale and does so. Its intervention is met by warnings and threats from the other side. One side, and probably then the other, places its forces on some level of alert. Intelligence-gathering processes are under great strain. National leaders are watching events with anxiety. One side places its forces in a higher state of readiness and the other, predictably, follows suit. The danger at this point is enormously heightened by any pressure to launch a pre-emptive attack. The situation is tense and conspicuously unstable. Any spark — a false radar warning, an accidental overflight, a failure in communications—could trigger an accidental war.

The critical point in this cycle of events is reached not when one side becomes convinced that the other side is about to attack, **but when either side concludes that the situation has deteriorated to a state where war is inevitable.** This kind of critical point is even harder to specify or to determine in advance; clearly the side which perceives the "inevitability" of war first has the advantage. All this offers the possibility of shortening drastically and tragically the time-period over which the strategic guessing game is played.

Occasional attempts have been made to discuss the U.S. strategic deterrent in relation to a "retaliatory threshold": a level of provocation below which strategic retaliation would not be launched. Certainly, both the Western and the communist nations, in evident recognition of the dangers, tolerate incidents which might in former times have led to war. Overflights, accidental or deliberate, occur; planes are occasionally shot down; radio broadcasts are jammed; abductions occur; insults and threats are traded; and so on. Some lesser overt acts of war would probably also be tolerated, depending on the circumstances. But because of the extremely wide variety of possible provocations the significance of an unambiguously defined retaliatory threshold is doubtful. Moreover, a threshold, if it were to reduce the danger of accidental war, would have to be known to the enemy, and this contradicts the long-standing military principle that it is desirable to keep the enemy guessing.

CONCLUSIONS

Several major conclusions emerge from our study :

(1) Taking together all the dangers, **there is a significant chance that a major accidental war may occur at some time in the 1960's.** The problem of accidental war has received too little public recognition and discussion and, very probably, too little explicit attention in our security planning.

(2) The danger of accidental war rises sharply in periods of international tension. At such times normally insignificant accidents may set in motion a kind of chain reaction of events leading to war. What is predictably improbable in normal times becomes unpredictably probable in abnormal times.

(3) The danger of accidental war depends on the nature and balance of nuclear forces and the states of readiness in which they are held. Vulnerable strategic forces, such as manned bombers and some liquid-fuelled ballistic missiles, tend to be dangerous. Next in importance, the danger depends in an unpredictable manner on a variety of human factors, including the predispositions of national leaders for taking or avoiding action.

(4) An accidental war is most likely to come about through the spread of a small war or through major high-level miscalculation. It is relatively unlikely to result from purely technical mishaps, **except** when complicating circumstances, such as might exist in times of tension, are present.

(5) The danger of accidental war increases when a nation's policies and intentions are ambiguously stated and poorly communicated to a potential enemy. In the present period of poised nuclear forces and **very short reaction times,** it is important to be able to distinguish between real policies and propaganda and between idle threats and genuine dangers.

(6) The danger of accidental war increases with the spread of nuclear weapons and their means of delivery. Red China is a cause for special concern in the 1960's.

PROPOSALS

We believe that a number of steps to reduce the danger of accidental war are feasible at the present time. Some of these steps will require formal or informal agreement among nations. Others, which have apparently received little serious consideration, can be taken unilaterally by the United States with no significant loss of military security. Unilateral steps include:

(1) Official recognition of the danger of accidental war and a publicly declared intention to seek ways to reduce the danger.

(2) Recognition, in practice, that the traditional military principle which aims at keeping the enemy guessing at one's intentions may be dangerously out of date in the nuclear-missile age.

(3) In the military sphere, still greater emphasis on relatively invulnerable strategic forces and a flexible non-nuclear capability.

(4) Communication to possible enemies of the manifestly non-aggressive character of U.S. military plans and preparations. More information on weapons system safety measures can be released without compromising security. Military training operations, including practice alerts and SAC flights, can be conducted in a conspicuously non-aggressive manner. U.S. strategic doctrine can be made to stress exclusively, in word and deed, a second-strike capability. Imaginative study of this communication problem might reveal many helpful measures. Reciprocation of some of these unilateral measures by a potential enemy could yield very significant gains in the stability of the deterrent balance.

Multilateral measures on which U.S. initiative is needed include:

(1) Clearer recognition and study of the accidental war problem as an important area of arms control negotiations. A variety of small but collectively very significant safeguards against accidental war might be more susceptible of negotiation at this time than, say, a nuclear test ban.

(2) Special study of the possibility of providing very fast and reliable communication between top national leaders on each side to help head off any crisis before it leads to disaster. A number of ingenious safeguards against deception could be built into this "assurance system".

A NOTE ON THE ABOVE PROPOSALS BY THE PUBLISHERS

We feel it necessary to comment on the proposals which conclude the report, as distinct from its general analysis. Dr. John B. Phelps, who led the seminar which prepared the report, wishes to make it clear that these proposals reflected the views of the authors on the most immediate and practical way to reduce the danger. He says that the authors' general view is that "limited, time-gaining steps in the nature of multilateral military accommodations may be feasible and quite valuable, but that the total threat of advancing weapons technology must ultimately be met in other ways".

Although we would welcome any unilateral or multilateral measures which tend to stabilise the Arms Race (renunciation of testing, and a test ban agreement, are good examples of such measures), we feel that within the context of the Arms Race very little of this nature can be achieved. To take but one example, one of the above proposals advocates greater emphasis on relatively invulnerable strategic forces, which clearly implies, among other weapons, Polaris. The price of this supposedly safe "invulnerable" system seems to us prohibitive: if to make a weapons system "safe" it is necessary to extend the cold war to the entire undersea, to create an entirely new danger that the Russians will trail Polaris with their own submarines, and to incur the risk of unauthorised firing, then it seems to us that the price is not worth paying, and that the risk of accidental war has been reduced on one front, only to be increased on another.

With weapons technology getting out of hand, and with the spread of nuclear weapons to other countries increasingly probable, we believe it has become more apparent than ever that the only real defence and collective security is in disarmament. We publish this report in the hope that those who read it will consider in what way they can best act against the threatening dangers of the Arms Race.

For Further Reading

THE ARMS RACE, Philip Noel-Baker. A comprehensive study of armaments and disarmament proposals - - 12s. 6d. (1s.)

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